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SCIENCE NEWS LETTER

TECHNOLOGY DEPT.

THE WEEKLY SUMMARY OF CURRENT SCIENCE • NOVEMBER 14, 1942



Failure
See Page 312

A SCIENCE SERVICE PUBLICATION

485 W. HILLYARD AVE.
DETROIT MICH

Do You Know?

Plastic buttons are replacing metal on British uniforms.

Darkness is important to stored potatoes, as light may spoil their taste.

Modern dehydration can reduce 80 pounds of peas to 15 pounds in less than ten hours.

The only native diseases of Iceland are amebic dysentery and scurvy, which are easily prevented.

The thrasher, which is a member of mockingbird family, can mimic human conversation as well as bird songs.

Louisiana and South Carolina have passed laws requiring the enrichment of flour and bread, as a measure for improving nutrition of the populations in those states.

An estimated 25,000 or 30,000 blind persons could be used in war industries; they would not only equal normal production rates but would actually decrease accident rates.

The broad nose of the Negro is adapted to breathing air at relatively high temperatures, while the longer, narrower nose of the white is better adapted to low temperatures.

While there is no nourishment in water, it is vital for at least five reasons: lubricating human joints, diluting blood and lymph to promote circulation, regulation of body temperature through evaporation, and assisting in digestion and excretion.

SCIENCE NEWS LETTER

Vol. 42 NOVEMBER 14, 1942 No. 20

The Weekly Summary of Current Science, published every Saturday by SCIENCE SERVICE, Inc., 1719 N St., N. W., Washington, D. C. North 2255. Edited by WATSON DAVIS.

Subscriptions—\$5.00 a year; two years, \$7.00; 15 cents a copy. Ten or more copies to same address, 5 cents a copy. Back numbers more than six months old, 25 cents.

In requesting change of address, please give your old address as well as the new one, at least two weeks before change is to become effective.

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Cable address: Sciencserv. Washington.
New York office: 310 Fifth Avenue, CHickering 4-4565.

Entered as second class matter at the post-

Question Box

Page numbers of Questions discussed in this issue:

AGRICULTURE

What new spray will control blue mold of tobacco? p. 312.

BOTANY

What would make a mold moldy? p. 309.

CHEMISTRY

What will be done with Lalor Fellowship funds during the time that they are suspended? p. 313.

EDUCATION-MILITARY SCIENCE

What pre-induction courses are planned for high schools? p. 314.

ENGINEERING

To whom was the 1943 John Fritz Medal awarded? p. 312.

MEDICINE

How is Pennsylvania caring for men rejected in draft? p. 308.

How would a proposed bill add to the burdens of the Veterans Administration? p. 308.

What disease-fighting chemicals have been secured from fish sperm and sweetbreads? p. 313.

What new method has been devised for watching the process of healing in a wound? p. 316.

What special provisions are being made for caring for Navy casualties? p. 307.

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

What step has been taken toward developing a better anti-typhoid vaccine? p. 316.

With what sort of splint can a broken-jawed patient eat regular diet? p. 310.

Why is the number of epilepsy cases expected to increase during the war? p. 307.

MEDICINE—PSYCHOLOGY

How is a victim of hot chowder contributing to the knowledge of stomach ulcers? p. 312.

PHYSIOLOGY

What new effect of vitamin K deficiency has been observed in animals? p. 313.

PUBLIC HEALTH

How can a post-war depression be avoided? p. 309.

How long can working hours be without interfering with health and efficiency? p. 309.

Of what health conditions has Brazil complained to our Government? p. 313.

PUBLIC HEALTH—GEOGRAPHY

In what part of the country are draft rejections for blindness most numerous? p. 312.

RADIO

How can a woman trained in radio contribute to the war effort? p. 315.

The 42 strategic materials which we had to import for the last war have now been reduced to 15.

Sage and other cooking herbs, once imported from Europe, can easily be grown in this country.

British tests show that Diesel trucks can be run successfully on vegetable oils, such as peanut oil, but mineral oil is needed to start the engines.

Most of the flies we see in the fall are not house flies, but cluster flies, a parasite of earthworms.

Wooden fence posts treated with chromated zinc chloride last three to ten times longer than if untreated.

Empty beer bottles are salvaged in the Middle East, by converting them into drinking glasses; even their necks are used—for insulators on telegraph poles.

office at Washington, D. C., under the Act of March 3, 1879. Established in mimeographed form March 18, 1922. Title registered as trademark, U. S. and Canadian Patent Offices. Indexed in Readers' Guide to Periodical Literature, Abridged Guide, and in the Engineering Index.

The Science Observer, established by the American Institute of the City of New York, is now included in the SCIENCE NEWS LETTER.

The New York Museum of Science and Industry has elected SCIENCE NEWS LETTER as its official publication to be received by its members.

Member Audit Bureau of Circulation. Advertising Representatives: Howland and Howland, Inc., 393 7th Ave., N. Y. C., Pennsylvania 6-5566; and 360 N. Michigan Ave., Chicago, STate 4439.

SCIENCE SERVICE is the Institution for the Popularization of Science organized 1921 as a non-profit corporation.

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MEDICINE

Casualty Care Planned

Swift rescue ships, special litters and use of non-medical personnel to assist surgeons are among measures used by the U. S. Navy.

► **SWIFT; LIGHT**, easily handled ships for rescuing men from sinking vessels, special litters equally suited to transportation on land and onto ships, one-man-carry packs of medical supplies for landing parties, twin medical stations on ships, and planned use of non-medical personnel to assist the surgeons are among the measures used by the U. S. Navy for caring for battle casualties.

They were described by Captain William L. Mann, Medical Corps, U. S. N., at the meeting of the Association of Military Surgeons of the United States. Captain Mann, medical officer in command of the new Naval Medical Research Institute of Bethesda, Md., and first vice-president of the Association, spoke in behalf of Rear Admiral Ross T. McIntire, Surgeon General of the Navy.

The twin medical stations on ships with division of medical supplies and personnel are planned so that if one is put out of action by damage to part of the ship, medical care will still be available for the wounded.

The back-pack containing all items for battalion dressing station and company aid men with marine corps units is designed so that one hospital corpsman can carry it and at the same time have his hands free for use in debarking over the ship's side and over the gunwhales of ambulance boats. It is in line with the accepted idea of mobility of medical establishments and the principle of taking the treatment to the wounded rather than taking the wounded to the treatment.

This principle was developed by Dominique-Jean Larrey in 1792 when he organized a "flying ambulance corps" and was followed in World War I by the actual use of airplanes to transfer medical personnel and materiel near the scene of conflict. A demonstration of transporting field hospitals to the scene by airplane, and dropping tentage, supplies, doctors and nurses by parachute, Captain Mann said, was given in one of the European capitals a few years ago.

Assistance of non-medical personnel is planned because, he declared, it is almost axiomatic that in any catastrophe,

military or civil, adequate medical personnel is seldom available to handle the personnel casualties promptly and efficiently.

He expressed gratification that this principle has also been well recognized in civil life as shown by the many persons on the home front who have taken courses in first-aid training since the war started.

The problem of adapting a suitable litter for land and sea evacuation has been solved by use of the standard Army litter with bunk straps which are readily available on board ship. Light folding litters and a light waterproof substitute for blankets have been adopted for use during the highly mobile stage of land engagements. Collective litter hoists which Capt. Mann showed save valuable time in embarking the wounded on combined land and sea operations. If by the use of such expedients, he pointed out,

five minutes can be saved in handling each patient, there will be a saving of two days in loading one hospital ship with 575 casualties.

Science News Letter, November 14, 1942

MEDICINE

Epilepsy May Increase Due to War Wounds

► **THOUSANDS** of war workers are being wasted through neglect and prejudice because they have a background of epilepsy, Dr. William G. Lennox told the New York Academy of Medicine meeting in New York.

During the war the number of epileptics will increase due to brain wounds, of which 5% to 15% will cause epilepsy, judging from the last war. The proportion may even be higher this time, Dr. Lennox believes, because new drugs will save the lives of many with brain wounds who before would have died.

Most employers will not knowingly hire an epileptic, Dr. Lennox pointed out, yet probably upwards of two-thirds of the present 350,000 could do useful work.

Many of these persons are denied employment through prejudice or fear of the employer that he will be held liable



COAST ARTILLERY—Gun mounts in the shops of the Baldwin Locomotive Works. This famous builder of locomotives is now at work on several types of war material. The mounts shown weigh 250,000 pounds each and are built from steel castings produced in Baldwin foundries.

for injuries sustained as a result of a "fit" on the job.

Hope for decreasing the number of epileptics lies mainly in neurosurgery and finding more effective anticonvulsant

drugs. But the lot of almost every patient can be improved, Dr. Lennox declared, by encouragement in intellectual and vocational pursuits and by reorienting the hopes and attitude of the patient.

Science News Letter, November 14, 1942

MEDICINE

Prepared for Wounded

Condition of Veterans Administration is better than at close of World War, but expanded Army and provisions of new bill may add to demands upon it.

► THE VETERANS Administration is today "far better prepared for eventualities" than it was at the close of the 1917-1918 war when it had to "start from scratch," Dr. Charles M. Griffith, medical director, declared at the meeting of the Association of Military Surgeons of the United States in San Antonio.

Total number of ill and injured ex-members of the armed forces for which the Veterans Administration will have to provide medical care after this war cannot be estimated and the Army's estimate for the number during the fiscal years 1943 and 1944 cannot, of course, be divulged. An idea of the expansion of Veterans Administration facilities that will be needed can be gleaned from the fact pointed out by Dr. Griffith that "enlargement of the Army and Navy has progressed, if press reports are to be credited, to a total already exceeding the entire enrollment in 1917-1918" and the "official statement of the Secretary of War that a strength of 7,500,000 men is the present objective."

The total number the Veterans Administration will have to care for, however, may be greatly increased if a bill already passed by the House of Representatives (H. R. 7311) becomes law, Dr. Griffith declared.

"Applicants discharged from the present armed forces," Dr. Griffith explained, "are not acceptable for hospital treatment or domiciliary care by the Veterans Administration unless they had been separated from the service for disability incurred in line of duty, or were in receipt of a pension for service-connected disability."

The new bill, however, "authorizes for persons who served in the present Army or Navy the same benefits of hospital treatment or domiciliary care which are provided for persons who served in the World War."

The effect of this proposal, Dr. Griffith

stated, "would be felt mainly upon the provision of hospital treatment or domiciliary care for disabilities not due to military or naval service. Millions of possible beneficiaries would be newly created who, because of a status as 'veteran of a war,' would be potentially entitled to such hospital treatment or domiciliary care at any time in their lives" provided they meet certain eligibility requirements. These requirements do not exact an honorable discharge. A discharge not dishonorable will suffice, and there is no delimiting requirement as to the nature of the condition causing the disability.

In the present war, up to Sept. 1, 1942, under present regulations, a total of 4,377 applicants have been admitted to the Veterans Administration, Dr. Griffith reported. Of these, 1,886 were suffering from general medical or surgical illnesses and injuries; 1,463 were tuberculous; and 1,028 had neuropsychiatric disorders.

"These beneficiaries were, in the great preponderance, simply men who broke down in their training," Dr. Griffith stated.

The Veterans Administration has today a nucleus of hospital buildings with modern equipment and trained personnel and hopes by the time the war is over to have acquired more hospital beds and to be able to enlarge its medical and other necessary personnel from among doctors, nurses and others who will be demobilized.

Science News Letter, November 14, 1942

Pennsylvania Plan

► THE PENNSYLVANIA plan for handling the medical and health problems brought to light by Army service rejections was described by Major General C. R. Reynolds, U. S. A. Ret., now with the Pennsylvania Department of Health.

The 8,262 Pennsylvania men rejected up to Oct. 1, 1942, because of tuberculosis have been reported to State Tuberculosis Clinics and private physicians for treatment and for follow-up of possibilities of their having spread the disease to others or of those from whom they may have acquired it. The same sort of service and epidemiological follow-up has been extended to the more than 7,200 cases of syphilis in Pennsylvania men discovered in Army examinations.

The problem of men rejected for nervous and mental conditions is causing great concern among physicians and health authorities, General Reynolds emphasized. The proportion of rejections for this condition has risen lately, especially among Negroes, until it now accounts for about 13% of all 4-F rejections and is the largest single group in that classification. The number of mental and nervous cases in the Veterans and other government hospitals now accounts for about 57% of the total beds occupied and the peakload for the last World War alone has not yet been reached, he declared.

The medical care of these men is one of the most difficult problems of rehabilitation of men rejected for Army service. One important reason is that publicizing the fact that the men have been rejected because of nervous or mental conditions prejudices their position in society and their opportunities for employment.

Selective Service examinations today show no more physical fitness than in 1917, General Reynolds stated. Apparently, he pointed out, we have "the same kind of people, only more of them."

Present physical standards are high and should remain so, he believes, so that we may have an Army fit to "win the toughest war in history." But most of the physical unfitness is due to structural or physical defect rather than disease and much of it results from neglect and faulty use of the body which could have been prevented or remedied.

The situation, he said, "calls for physical training in our whole educational system and emphasizes the importance of physical medicine."

Science News Letter, November 14, 1942

The Federal Bureau of Mines is studying the possibility of mixing oil and pulverized coal to produce a *liquid fuel* that can be used in certain types of industrial oil-burning furnaces.

PUBLIC HEALTH

Master Postwar Plan

Following standards of medical and public health professions in giving peoples of the world food and housing needed will solve economic and agricultural problems.

► "LOOK TO the public health and medical profession for a master plan of world reconstruction," Sir John Boyd Orr, director of Great Britain's Imperial Bureau of Nutrition, declared at the meeting of the American Public Health Association.

If we bring to all the peoples of the world food and housing that meets the standards which the public health and medical professions have set for health, we shall have no economic, political, agricultural or trade problems or depressions after the war, he predicted.

This will mean great sacrifices for the wealthy nations for a long time after the war is won, but, Sir John declared, "the nation which gives most and quickest after the war is the nation which will attain world leadership and which will gain for itself agricultural and economic relief."

Sir John indicated that the idea of many people that we need a spiritual goal to fight this war is nonsense. If we must look to a spiritual concept, he said, we should turn to the greatest Physician of them all and remember that He fed the hungry.

"Thy kingdom come," in the daily prayers of millions of people throughout the world, does not, Sir John declared, refer to any future spiritual world but to this earth on which we live.

We must get away from abstract "isms" and down to concrete terms such as tons of food in post-war planning.

We must, Sir John said, literally beat our broken tanks and guns into plows and tractors and houses, schools and sanitation facilities for people all over the world if we want to win everlasting peace.

Science News Letter, November 14, 1942

PUBLIC HEALTH

60-Hour Week Maximum

Little would be gained by longer hours, but much would be lost in health and efficiency, Safety Congress was told. Women present special problem.

► THE AMERICAN work week may increase to 60 hours, but if this is exceeded little will be gained and probably more will be lost in both output and health, Dr. Morris Fishbein, editor of the *Journal of the American Medical Association*, declared at the National Safety Congress meeting in Chicago.

"Today industry works at tremendous speed. The stress placed on men, associated with the emotional conditions inevitably occurring in times of war, brings about physical and mental breakdown in a higher percentage than in peacetime because men are driven in many instances far beyond their capacities," Dr. Fishbein warned.

Illnesses of women in industry outnumber those of men. To maintain maximum health and production efficiency, Dr. Fishbein believes that women workers should have one day of rest in seven,

an eight-hour day except for temporary emergencies, sufficient meal and rest periods, and adequate medical care and other safeguards for health and safety.

Care of women in industry who are going to have babies is an important problem.

"In order to insure adequate medical supervision during this period," Dr. Fishbein said, "particularly when the woman is a worker in industry, in order to provide the necessary prenatal care, to prevent sickness and disability of the mother and possible death of the child before birth or at the time of birth, in order to maintain for the nation as a whole an adequate birth rate in relation to the great number of lives that will be lost in the war effort, the medical profession and public health officers might well consider at this time the desirability of having a report made to



STUDY—Non-commissioned officers of the British Royal Air Force are studying gun turret equipment in a course conducted by the General Electric Company to make United Nations representatives familiar with American-made aircraft armament.

the health department of the city or county at the time when the diagnosis of pregnancy is made so that public agencies may insure adequate prenatal care and medical supervision to prospective mothers."

By such planning and organization on the part of physicians it is expected that proper medical care can be maintained for civilians as well as the armed forces.

Today we still have better than one doctor for every 1,500 people, compared to a doctor for every 2,700 people in England, and reportedly as few as one for every 12,000 Germans.

Science News Letter, November 14, 1942

BOTANY

Mold That Makes Molds Moldy Found in Britain

► A VEGETABLE version of the old jingle about "big fleas have little fleas upon their back that bite 'em" might be based on a report of a mold that makes other molds moldy, by Prof. C. G. Dobbs of King's College, London. (*Nature*, Sept. 12)

The parasitic mold has been identified as belonging to the genus *Piptocephalis*. It preys upon the blue-mold group, various members of which ripen cheese and spoil fruit. It has also been found able to attack the black molds known commonly as bread-molds.

Science News Letter, November 14, 1942

MEDICINE

Quick Repair

New type of splint, developed originally because a veterinarian wanted to make injured pets more comfortable, now saves lives of Navy men and spares them agony.

By **ELSIE McCORMICK**

► A RECENT visitor to the Naval Hospital at Philadelphia was startled by the sight of three sailors—one with a leg broken six days before, another with an arm broken two days before, and a third with a jaw that had been broken only a week—having a little game in the recreation room.

The man with the broken arm was dealing the cards, the man with the fractured leg was walking — without crutches—around his chair to change his luck, and the man with the broken jaw was enjoying a consoling chew of tobacco.

No plaster casts, slings, or bandages were to be seen, and the tobacco chewer did not have his jaws fastened together or wear the usual plaster skull-cap with wires attached. Instead of any of these traditional devices, all three patients wore, over the broken part, a "Stader splint." This consists of a short metal bar, each end of which is firmly anchored, so as to bridge the fracture, by two stainless steel pins skewered into the bone. With the ingenious aid of screws, the broken ends can be drawn together and adjusted accurately, quickly, painlessly. Though it weighs only a matter of ounces, and therefore is no burden to the patient, it is strong and rigid enough to carry the strain normally put on the bone. It is at once a bone setting mechanism and a substitute bone.

Developed by Veterinarian

This splint was developed by a veterinarian, Dr. Otto Stader. After a long experience with animals, it was applied to human beings for five years by two leading surgeons at Bellevue Hospital in New York. Since last December it has been in use at the Philadelphia Naval Hospital. Results of these trials have just been reported in *Annals of Surgery* and *Surgical Clinics of North America*. Judging from results so far, the Stader splint is likely to bring about a tremendous change in the treatment of broken jaws and of the long bones of the arms and legs.

Pain and discomfort are very much lessened. Time lost from work is cut down to an extraordinary degree. In most leg fracture cases, the usual weeks and even months in bed are reduced to days; a few patients have even walked without crutches the very day after the bone was set. Provided that their teeth still meet as they should, jaw fracture patients can blithely eat solid food 24 hours after the Stader splint has been applied—a striking contrast to the five or six weeks of tube-feeding and the months of soft victuals usually endured. Instead of hanging immobile in a sling, a fractured arm can generally be used within a day or two. At the Philadelphia Naval Hospital, a sailor was photographed carrying a forty-pound suitcase with an arm that had been set only 24 hours before.

Dog Tragedy

The invention resulted from the tragedy of a dog. Dr. Stader, gray-haired and intensely serious, was a specialist in the diseases of cattle until the depression. Then he took over a small animal hospital at Geneva, Illinois. On his first day there, a widow brought in a wire-haired terrier with a broken leg. Dr. Stader, who had not treated a dog since he left college, took it to a colleague for consultation. First they put the leg in a plaster cast, which the dog promptly ate away. When they tried an aluminum splint, the terrier chewed off the adhesive tape. Next they cut into the leg and wired the two ends of bone together. But the patient tore away the bandages, an infection developed, and, to the great grief of its owner, the little terrier had to be destroyed.

Much chagrined, Dr. Stader set to work in his basement to devise a splint that would be comfortable, allow free use of the joints above and below the break, and hold the fragments in place without the use of plaster.

The principle of the metal splint fastened to the bone with pins was not new. The "Steinmann pins," invented by a Swiss surgeon, were introduced into this country by Dr. A. Codivilla

in 1904. But the fact that they had to go through the entire limb, coming out on the other side, and that plaster was still necessary, prevented them from being widely used.

Other surgeons — among them the Americans, Dr. Roger Anderson and Dr. H. H. Haynes — contributed improvements, such as shorter pins set in the bone at an angle. But the veterinarian felt that there were drawbacks to the devices that existed. After weeks of trial and error, he produced the Stader splint substantially as it is today.

The first patient was a chow dog with a badly fractured thigh bone. Using careful operating room technique, Dr. Stader fixed the pins in the dog's bone, above and below the break, and adjusted the screws and bar until the jagged ends had meshed. A few minutes after the chow came out of the anaesthetic, it got to its feet and walked across the room. It recovered without apparent pain, going through its normal cat-chasing routine while the leg bone knitted. Not once did it attempt to tear away the splint.

Since then, at Geneva and at his present animal hospital in Ardmore, Pennsylvania, Dr. Stader reports, he has



NORMAL STRENGTH—Although this man's arm was fractured only one day before this picture was taken, he is carrying a forty-pound suitcase.



JAW FRACTURE doesn't prevent these men from opening their mouths, chewing a regular diet and talking at will in spite of their injury. This is of extreme importance to men in the services.

treated more than 1,200 dogs with broken bones. The vast majority of them were able to stand, walk and run normally almost as soon as the operation was over.

He has also treated cats. And about three months ago he used an enlarged form of his splint on a mare, who grazed serenely in a meadow while her leg was healing. Formerly a broken leg meant that a horse had to be destroyed. If further cases confirm this first success, it will be possible to save the lives of many valuable and beloved horses.

In 1937, six years after Dr. Stader began using the splint on animals, his work came to the attention of Dr. Kenneth M. Lewis and Dr. Lester Breidenbach, both on the faculty of New York University's College of Medicine and in charge of much of the fracture work at Bellevue Hospital. Watching Dr. Stader put the splint on a police dog, Dr. Lewis was surprised at the simplicity and mechanical accuracy of the operation. He was even more amazed when he returned next day and saw the dog dashing 'round the kennels. A careful study of the splint convinced him and Dr. Breidenbach that it could be used successfully on human beings.

But an enormous amount of preliminary labor had to be done. The veterinarian worked nights in the basement of his animal hospital, adapting the splint to human arms and legs. Patiently, day after day, the two surgeons

broke bones in the autopsy rooms and fitted the apparatus to every possible variety of fracture.

A few months later, the splint was tried on their first human case—a merchant seaman who had fallen through a hatchway and badly broken his right leg between knee and ankle. He was not much impressed with his new splint; in fact he looked at the wires, pulleys and plaster casts that bedecked his ward mates and felt that he was being neglected. The doctors kept him in bed ten days before letting him bear his weight upon the broken limb. Moving pictures taken a few days later show him walking briskly up and down stairs. Not long after that he went to work at a new job on the waterfront. Ordinarily a man with his injuries would have been disabled for at least three or four months.

Even more striking was the case of a nineteen-year-old baker who had broken the lower bones of his left leg during a soccer game. At first his leg was placed in the usual plaster cast. Two weeks after the cast had been put on, the ends of the broken bone slipped and he returned to the hospital in agonizing pain.

This time Dr. Breidenbach put on a Stader splint. Two days later the young man was walking. Within a week he was back at work standing eight hours a day before his ovens, the instrument hidden from sight under his trouser leg.

In a third case, a woman who had slipped and broken her leg while mopping the kitchen floor was doing her housework again five days after the splint had been applied.

Shock Affects Some

Of course, not all patients with fractured legs are back in the running as soon as that. Many are kept in bed for several days by shock and by injury to the soft tissues resulting from their accident. Others cling stubbornly to crutches because they simply can't believe that it would be possible to step on their injured legs so soon.

But despite their early successes, for five years Dr. Lewis and Dr. Breidenbach proceeded cautiously, working out improved techniques, studying long-term results, publishing nothing. Not until the October, 1942, *Annals of Surgery* were the results of their work announced to the medical world.

Stirred by Pearl Harbor, Dr. Stader brought one of his splints to the Philadelphia Naval Hospital the very next day. After careful study, the Navy sur-

geons were sufficiently impressed to begin using it on trial.

Fractures have always been a nightmare at sea. Unless a special steadying device is used, legs supported by traction sway back and forth with the motion of the ship. In case of sudden disaster, men with legs supported by wires or encased in plaster casts are sometimes tragically handicapped. Transferring a broken-limbed sailor over the side of a ship in a canvas sling or bringing him down a ship's ladder in a full-length basket is a ticklish business.

Just after the splint was put in trial, a young service man was brought into the hospital with a compound fracture of the leg and a severe concussion of the brain. Temporarily out of his head, he thrashed about so much that there was no question of wires or pulleys. But after one of the new splints had been applied, his frenzied tossing did not harm the broken bones.

Extraordinary Cases

Soon there were other extraordinary cases—a young sailor walking around the hospital the day after the splint had been placed on a compound fracture of the lower leg; a gob caught by a movie camera in the act of picking up a 50-pound oak chair with an arm that had been set only 24 hours before.

At the Philadelphia Naval Hospital, the Stader splint was used for the first time on broken jaws. At sea, the usual treatment for such cases can be dangerous. A sailor whose jaws are clamped together must always carry a pair of clippers tied 'round his neck, so that he can cut the wires at once and avoid choking to death in case of a sudden attack of seasickness.

Six cases of broken jaws treated by the new method have been reported by Navy doctors. Patients whose teeth meet correctly have been able to eat, smoke, and chew gum almost as soon as the splint has been applied. If these good results are borne out by further tests, the horror of jaw fractures at sea may disappear forever.

Navy surgeons have also used a variation of the splint which Dr. Stader has worked out for broken heels. Heretofore, about ninety per cent of the victims have gone through life with an unnatural walk because it hurt to put their full weight on the damaged foot. Navy men so injured were nearly always discharged from the service. So far, Navy surgeons have used the new splint on six cases of fractured heel. Instead of having (*Turn to page 318*)

AGRICULTURE

Blue Mold of Tobacco Controlled by New Spray

► BLUE MOLD of tobacco, a destructive disease of seedlings also known as downy mildew, can be controlled by a simple spray of an organic fungicide recently placed on the market, Dr. P. J. Anderson of the Connecticut Agricultural Experiment Station reports (*Science*, Oct. 30).

Hitherto the best control has been fumigation with vapors of either benzol or paradichlorobenzene. This, however, requires the construction of tight enclosures around the seed beds, to prevent the gas from leaking out before it has done its work. A simple spray that can be used in the open is preferable, if effective.

The compound used in Dr. Anderson's spray is known chemically as ferric dimethyl dithiocarbamate. "Fermate" is the shorthand convenience-name under which it is marketed.

Science News Letter, November 14, 1942

MEDICINE—PSYCHOLOGY

Victim of Hot Chowder Aids Study of Ulcers

► NEW INFORMATION on peptic ulcer has been obtained from a human guinea pig, victim of a bowl of hot clam chowder. His esophagus obliterated as a result of drinking the scalding stew, the patient must be fed through a hole in the stomach. Through the same opening, observations ordinarily made only on laboratory animals are possible.

With relatively high incidence of stomach ulcer among troops subjected to the nervous tensions of modern war, the research results of Dr. Stewart Wolf of the Army Medical Corps and Dr. Harold G. Wolff of New York, reported (*Journal of the American Medical Association*, Oct. 31), confirm the belief that emotional conflict is a causative factor in forming ulcers.

Step-by-step observations of the goings-on in the patient's stomach during emotions of anxiety, hostility or resentment, showed increased acid secretion, more violent stomach movements and engorgement of the stomach lining with blood.

In this condition, small breaks in the stomach lining were induced by very trifling injuries, such as might be made by a sharp fragment of food. Bleeding points also occurred spontaneously, due

to the violent contractions of the stomach wall.

Most of these small erosions heal quickly unless there is a break in the insulating layer of mucus which ordinarily protects the stomach lining from the secreted acids. But prolonged exposure of a lesion to the acid stomach juice results in formation of chronic stomach ulcer.

Science News Letter, November 14, 1942

ENGINEERING

Welding in Army Airplanes Must Pass "Tee" Weld Test

See Front Cover

► EVERY WELDER working on Army contract material must submit to the "tee" weld test shown on the front cover of this week's *SCIENCE NEWS LETTER*.

The test of a standard Army weld sample is made at irregular intervals on the work of each welder. The sample shown failed, because part of the break occurred in the weld rather than in the parent material. The welder must now produce a satisfactory weld sample before he can again work on Army aircraft material.

This official photograph was made by the Office of War Information in the laboratory of a large western aircraft plant.

Science News Letter, November 14, 1942

ENGINEERING

Highest Engineering Award To G. E. Research Director

► HIGHEST AWARD in the field of engineering, the John Fritz Medal for 1943, will be presented to Dr. Willis Rodney Whitney, director emeritus, General Electric Company's research laboratories, and nonresident professor of chemical research of the Massachusetts Institute of Technology.

The medal will be awarded to Dr. Whitney for "distinguished research" and for "co-ordinating pure science with the service of society through industry."

Dr. Whitney has been associated with the G. E. laboratories since their inception in 1900, and is credited with being mainly responsible for the up-building of these pioneering institutions and for their outstanding achievements during the intervening years in both pure and applied science. He has published many chemical papers of his own and has been the recipient of many previous awards and honorary degrees.

Science News Letter, November 14, 1942

IN SCIENCE

PUBLIC HEALTH—GEOGRAPHY

Distribution of Physical Defects to Be Studied

► SEARCH for the reason why draft boards are having to turn down more men for bad teeth in New England, heart trouble in the Northwest, goiter in the Great Lakes region and blindness in Texas, will soon be started at Columbia University, under the direction of Dr. Harry L. Shapiro, the American Museum of Natural History.

The geographical distribution of characteristic physical defects is partly due to heredity, partly to social or local geographic conditions, and partly to a mixture of the two, Dr. Shapiro believes.

The fact that mental disorders are found most frequently in Maine, Virginia, the Carolinas, Tennessee and Mississippi, and the high incidence of venereal disease, drug addiction and alcoholism in the Gulf States and the Southeast is probably due to environment.

But the deafness found in the Northwest and New England and the lack of weight characteristic of the east coast and of California may be hereditary.

Science News Letter, November 14, 1942

SEISMOLOGY

Earthquake in Ocean Missed Japan by 300 Miles

► A STRONG earthquake shock shook the bottom of the western Pacific late on Monday afternoon, Oct. 26, but missed the target. Epicenter was about 300 miles off the coast of the island of Hokkaido, Japan, U. S. Coast and Geodetic Survey seismologists reported after studying instrumental data collected telegraphically by Science Service.

The tremors began at 5:09 p.m., EWT; center of disturbance was given provisionally as in latitude 44 degrees north, longitude 152 east.

Observatories reporting were those of the Jesuit Seismological Association at Georgetown University, Spring Hill College near Mobile, Ala., and Fordham University; and the stations of the U. S. Coast and Geodetic Survey at Tucson, Ariz.; and Ukiah, Calif.

Science News Letter, November 14, 1942

NE FIELDS

CHEMISTRY

Lalor Fellowships Suspended for Duration

► AWARDS of the Lalor Foundation postgraduate fellowships in chemistry, among the most prized of aids to young research workers, will be suspended until after the war, it was announced at Wilmington, Del., by Dr. C. Lalor Burdick, director of the Foundation. Funds that would normally be granted each year will be accumulated into a reserve, permitting a larger number of young men and women to undertake their problems immediately upon the return of war-absorbed leaders in science to their peace-time posts.

The backlog thus established already provides for 15 fellowship awards in the first year of peace. Basic stipend of the Lalor Foundation fellowships is \$2,000.

Four final awards have just been made, all to young men engaged in research on wartime problems. They are: A. C. Bratton from the University of Texas, who will carry on his work at the Johns Hopkins Medical School; E. H. Frieden from the University of California, who goes to the University of Texas; F. J. Reithel from the University of Oregon, who will be at the St. Louis University School of Medicine; and J. R. Weisiger from the Johns Hopkins University, who will study at Harvard University Medical School.

Science News Letter, November 14, 1942

PUBLIC HEALTH

U. S. Leadership in Public Health Slipping

► THE UNITED STATES is in danger of losing, if she has not already lost, her position as leader in health protection for the people of the western hemisphere, Dr. Thomas Parran, surgeon general of the U. S. Public Health Service, reported from his findings on his visits to Mexico and to the Pan-American sanitary conference in Rio de Janeiro.

When air travel between North and South America was instituted some years

ago, the United States was greatly concerned over the possibility that yellow fever would be reintroduced to the country from South America.

The shoe is on the other foot now, and Brazil is rightly exercised and has made representations to our State Department because yellow fever mosquitoes and even the tse-tse fly, carrier of deadly African sleeping sickness, have been found on American airplanes entering Brazilian ports from Africa.

The Brazilian government, at a cost of \$2,000,000 and with aid from the Rockefeller Foundation which spent \$200,000, has eradicated both African and American yellow fever mosquitoes from all her port cities and from eight of her states. Only one United States port, Miami, Florida, has done anything like this, Dr. Parran said with chagrin.

Americans need to recognize, he declared, that continental health security and solid Pan-Americanism run on a two-way track. Brazil's vast accomplishment in wiping out yellow fever danger in her cities and states does not remove the danger of yellow fever striking Brazilians or other Americans unless we and other American nations wipe out the yellow fever danger within our own boundaries.

Science News Letter, November 14, 1942

PHYSIOLOGY

Lack of Vitamin K May Produce Abortion

► POSSIBILITY that vitamin K may play a role in some cases of abortion is suggested by research results discussed in *Nutrition Reviews* (November). The research was conducted by Drs. Robert A. Moore and Mary L. Miller of St. Louis, Isabelle Bittinger, of New York, and Louis M. Hellman of Baltimore.

Although this function of vitamin K has not yet been shown in humans, experiments with rabbits insufficiently supplied with vitamin K invariably resulted in abortion. All test animals had previously given birth to normal litters. Control animals receiving the same diet, but including vitamin K, continued to have normal births.

Internal hemorrhage of a type occurring in premature delivery in humans, was observed by microscopic examinations of tissue from the test animals.

Abortions resulted, it is concluded, from lack of the precursor to the clotting factor in the blood, called prothrombin—a condition associated with vitamin K deficiency.

Science News Letter, November 14, 1942

MEDICINE

Chemical Germ-Fighters May Come from Fish Sperm

► A NEW CLASS of chemical germ-fighters may come to take their place with chemicals from the dye vats and from microorganisms of the soil to help protect man against disease.

The new anti-germ chemicals have an animal origin, coming from fish sperm and calf sweetbread (thymus gland). Possibilities of their use to fight germs are reported by Dr. Benjamin F. Miller, Dr. Richard Abrams, Dr. Albert Dorfman and Dr. Morton Klein, of the University of Chicago department of medicine and Zoller Memorial dental clinic (*Science*, Nov. 6).

The fish sperm chemical is protamine, familiar in slow-action protamine insulin. The sweetbread chemical is histone. Both these chemicals attack germs by interfering with their respiration, thus suffocating the germs. One chemical acts in acid medium and the other in alkaline.

The Chicago investigators suggest that protamine might be used to "sensitize" certain germs belonging to the gram negative group, so that they could be successfully attacked by antibacterial compounds such as gramicidin, from soil microorganisms, which ordinarily is effective only against gram-positive germs.

Use of protamine or histone as chemical remedies is limited by their toxicity when injected into veins or the peritoneum, but a possible use for skin ailments or skin disinfection appears in the report that they have no apparent toxicity for such a tissue as the rabbit eye.

Science News Letter, November 14, 1942

BACTERIOLOGY

Bacteriologists Call For Movies as Teaching Aid

► THE CALL has gone forth from the Society of American Bacteriologists for motion pictures to aid in wartime teaching. With accelerated courses and shortage of teachers at many colleges, it is believed motion pictures on bacteria, rickettsiae, viruses, fungi and animal parasites would be helpful in stopping the gap.

The Society has appointed a committee, under the chairmanship of Dr. Harry E. Morton, of the University of Pennsylvania School of Medicine, to collect information on the usefulness and availability of such films.

Science News Letter, November 14, 1942

EDUCATION—MILITARY SCIENCE

Pre-Induction Training

Public high schools have been called upon to see that Army is provided with a flow of trained manpower to keep our weapons fighting. Five courses planned.

By JAMES P. MITCHELL

Director, Civilian Personnel Division,
War Department (Over Columbia
Broadcasting System under the auspices
of Science Service)

► IN 1943, we shall have an army of 7,500,000 men. All of them, fathers and sons, husbands and brothers, will be in uniform; ready to give their lives to the nation so that a better world can be built.

When we entered the war just eleven months ago, few of these men expected to be in the Army. Only a tiny fraction of them were professional soldiers. A few more of them had already been called to serve because the war clouds were then gathering. But most of them, by far, were pursuing the ways of peace, in stores, in factories, in offices, in mines, and on the farm. About a million of them, boys in their teens, were sophomores in high school when Japan attacked Pearl Harbor.

Almost overnight, seven million men are now called upon to leave their homes and to change their way of life. They are asked to do battle against an enemy who for more than ten years has been organizing and preparing for this day. While we were concerned with education, with standards of living, with the preservation of human dignity, they were secretly planning for war, depressing their people to bare subsistence, regimenting the common man to tyranny in the hope of speedy conquest.

If this were a war after the ancient pattern, there could be no doubt as to the outcome. Man for man, we are stronger; our will to fight is greater; our cause is just. But this is not an ancient war. It is a war of science and technology. Our enemies are strong because they have built many machines to multiply their strength and have trained many men to use them.

Complex Combat Machine

The modern combat division is a huge and complex machine manned by specialists. All of its intricate parts are closely articulated. Its purpose is to move, rapidly, relentlessly, so as to kill and destroy. To meet such an enemy,

our seven million must be better organized, with more and better material, and with manpower that is better trained. The mere will to fight, and a just cause are not enough.

Unless we halt the enemy machine, all the gains free men have made in a thousand years will be swept away. We must face unflinchingly the necessity of contributing, if need be, seven million of our best physical specimens, for only they can fight this kind of war. But, more important, each of the seven million must be given knowledge and skill to fight effectively.

General B. B. Somervell saw what it will take to win when he made his eloquent and stirring appeal to the schools and colleges of the nation last August. "The job of the schools in this total war," he said, "is to educate the nation's manpower for war and for the peace that will follow. We can lose this total war on the battlefield as a direct result of losing it on the education front. Our job is to teach men to fight. We cannot long continue to take the time and facilities needed for fighting and use them on a job for which the schools are better equipped than is the Army."

Challenge to Schools

Suiting action to words, General Somervell established the Pre-Induction Training Section of the Civilian Personnel Division, Services of Supply, as the central coordinating agency of the War Department to simplify and facilitate arrangements for the appropriate training of individuals prior to their entrance into military service. Never before in the history of our country has such a direct challenge been made to school teachers and administrators. The schools and colleges have been given a definite job to do. That job is to provide trained manpower that will not only produce the weapons for the Armed Forces but provide the Armed Forces with men who know how to keep the weapons rolling and keep them fighting.

The response of the schools was electric. From all parts of the country came the cry: "What do you want us to do? We'll do it!"

With the cooperation of the U. S. Office of Education, experienced officers and classroom teachers were put to work, examining and analyzing the training program of the Army. It was immediately clear to these officers and teachers that the schools can undertake certain basic aspects of the training in several fields. Selecting the particular Army jobs where shortages are critical, they formulated teaching outlines. The subject matter included was justified by its importance to the work of a soldier. This was judged and decided by Army experts in various branches of the service. The organization of the courses was determined by the essential teaching needs and facilities of the schools as judged by educational experts. The outlines were prepared to serve all three divisions of the Army, the Army Air Forces, the Army Ground Forces and the Services of Supply.

Victory Certificates

Upon successful completion of these courses, the high school student will be awarded Victory Certificates. These certificates will accompany the inductee to the Army reception center and will be used as evidence in determining the proper assignment of the man.

On September 15, copies of the outlines were released to over 3,000 school officials. Although plans for the Fall semester had been made in June, school authorities in many sections of the country did not hesitate to alter these plans so as to include pre-induction courses.

Schools have abandoned "business as usual" and are going "all out" for the war effort. There are indications that every school in the nation plans to have some form of pre-induction training in effect by February 1.

The courses which the schools have so willingly accepted are based upon Army needs in fields of critical shortage. Three of the pre-induction courses are basic to training for hundreds of different Army jobs. For example, the course in Fundamentals of Electricity provides a foundation needed in about 150 Army occupations. Similarly, the course in Fundamentals of Machines contributes to about 220 Army occupations. The course in Fundamentals of Shopwork offers manipulative experiences, needed in more than 180 Army occupations.

Two additional course outlines have been prepared for use in a more advanced stage of pre-induction training. A course in the Fundamentals of Radio and another in the Fundamentals of Automotive Mechanics introduce the

high school student to specialization.

Vocational and technical schools and many general secondary schools will offer pre-induction training on a third-level of specialization, with courses designed to furnish considerable degree of *operational skill*. Though there are many courses of this type which might be developed, the following make a maximum contribution to Army needs at the present time: Radio Code Practice and Touch Typing and Radio Maintenance and Repair.

A careful and analytical study of the technical and field manuals used by the Army in its post-induction training reveals unmistakably that clear understandings are essential for the development of the needed skills. Without such

understandings, development of the skills is difficult and sometimes impossible. Again and again the Army devotes many hours of valuable time to a kind of teaching which could have been done before the inductee came to the Army.

There are two main divisions of these training courses for future soldiers. One is for young men now in schools. But, all the graduates of all our high schools last June would not be sufficient to meet a two-months' requirement of our induction centers. So the bulk of the trainees will be older men.

Hence, the job in the schools is to take the raw material of good American bone and sinew and brains, and convert it without a waste motion or a waste minute into the kind of men we need.

Science News Letter, November 14, 1942

RADIO

Radio Jobs for Women

► WAACs WILL be trained to replace enlisted men in the Army Air Forces as radio operators and radio mechanics in a course given under the direction of the U. S. Army Signal Corps.

The first group will begin training on November 30. Three other groups are now scheduled to take the training, beginning at intervals of about one month.

Girls selected to go to Kansas City, Mo., for the radio training will be picked from the ranks of the WAACs during their basic training. Requirements are that they must have high school education, including physics. They must be mechanically inclined and must pass the Signal Corps aptitude test, which measures the speed and accuracy with which the individual can distinguish sounds. They must be able to type and must pass the Army's classification test.

The woman who is already trained as a radio amateur and has her license must enlist in the same way as others in the regular force of Army Auxiliaries and must take the same basic training. But, of course, she stands a much better chance than the others of being selected for the radio training.

Women are in demand for radio jobs in eight other branches of the war services, a survey by George W. Bailey, chairman of the Radio Section, Office of Scientific Research and Development, has revealed. The jobs are open to women who know enough code and theory to pass amateur radio operator's examination.

1. Women are needed as junior aircraft communicators by the Civil Aeronautics Administration. The CAA offers a six-months' course of instruction for this work. Pay during the training course is \$1,440 a year with an advance at the end of training to \$1,620. Applications are handled by Civil Service.

2. The Army Air Forces are using women for instructors. Student instructors can make \$1,620 and experienced radio women can get \$2,000 at four schools—Scott Field, Ill., Chicago, Sioux Falls, S. D., and Madison, Wis. Apply to Civil Service if you are interested.

3. The Signal Corps General Development Laboratory at Fort Monmouth, N. J., is taking women from 16 to 50 years old. A six-months' training course is offered during which students are paid \$120 a month with employment at the end of the course at \$135. Applications are handled by Lieut. John T. Freeman, General Development Laboratory, Signal Corps, Fort Monmouth, Red Bank, N. J.

4. The Navy wants trained women for the Radio Section, Bureau of Ships. Applications are handled by Lieut. L. B. Wheeler, Room 2N-21, Navy Department.

5. The Naval Ordnance Laboratory, Navy Department, attention Mr. Ralph Cautley, is also employing trained women.

6. The Naval Research Laboratory, Anacostia, D. C., attention Mr. Fred A. Pierce, can use the services of women.

7. Outside the Government, the Ra-

diation Laboratory, Massachusetts Institute of Technology, Cambridge, Mass., has a few openings for qualified women. Information about them can be obtained from Dr. F. W. Loomis.

8. The WAVES offer radio assignments to enlisted women.

Although women desiring radio positions must first learn the radio code, jobs as code operators just do not exist for women, Mr. Bailey said. The armed services use teletypes entirely for most radio communication. Code is tapped out only in the field in the front lines.

It is necessary to learn code, however, in order to obtain an amateur radio license, and this license is a stepping stone to most radio jobs.

To prepare for the license examination, you can go to a commercial or Government sponsored radio school, take a correspondence course from a commercial school, or you can study at home. Mr. Bailey recommends for home study a small library of books which can be obtained for a total of \$1.75. These include a "License Manual", "Learning the Code," "How to Become a Radio Amateur Operator" and "The Radio Amateurs' Handbook."

Science News Letter, November 14, 1942

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MEDICINE

Wound Healing Watched

Glass slide imprint of wound surface, showing cells, exudate and bacteria, provides simple and reliable way to follow healing process.

By NICOLAI KRAINOV

By wireless from Moscow

► A SIMPLE and reliable method of wound examination which enables the surgeon to determine the character of the infection, to follow up the healing process, to check the efficacy of medical treatment and, what is particularly important, to forecast the outcome has been devised by Dr. M. P. Pokrovskya.

Dr. Pokrovskya is known throughout the Soviet Union as a thoughtful, self-sacrificing scientist, who did not hesitate to vaccinate herself to test the effectiveness of an anti-plague serum she prepared.

During the present war she has engaged in the study of wounds and has succeeded in showing that the appearance of one or another kind of cells, their number, vitality and interrelations are processes obeying certain regularities.

"The discovery of Dr. Pokrovskya," says Academician N. Burdenko, "suggests a new method which enables the surgeon to foretell the issue of the affection."

Dr. Pokrovskya makes a glass slide imprint of the wound surface which contains not only the exudate but also the exudate cells and in this way the course of the healing process can be visualized as in a mirror.

The imprint is made by laying the glass slide on the surface of the wound. The imprint thus obtained of the cells, bacteria, exudate and so on is then stained and examined under the microscope.

Surgeons who apply Dr. Pokrovskya's method told me they admire it very much as it enables them to prescribe infallible methods of treatment and to predict the course of the healing process. It is particularly noteworthy that while dressing the wound the surgeon can make and interpret (or read) the imprint in fifteen minutes, determining what kind of cells the wound contains that day, and whether its symptoms are alarming or favorable.

In reading the preparation the surgeon notes, for example, that there have appeared in the wound exudate Unna's

plasma cells. He knows that this signifies a prolonged healing. These cells appear when molecular disintegration of the tissue begins. They never make their appearance when the healing process goes on at a high rate.

Dr. Pokrovskya's method proved very valuable in treating gas gangrene, a grave infection requiring prompt treatment as the toxin exerts a very strong depressory effect upon the organism. Bacteriologists are sometimes unable to

identify the wound fast enough, so it is easy to understand the significance of the imprint method which gives the necessary answer in fifteen minutes.

Here is one such case: Gas gangrene has developed in a wounded patient. "Perfringens" bacillus has been isolated from the wound and a grave septic state has begun. After consultation, it is decided to amputate. But in the imprint macrophages have appeared, their number increasing with every new imprint. The operation was postponed and the patient recovered. He owes his leg to the method of Dr. Pokrovskya.

The method has attracted the attention of Soviet scientists and by means of it study is being undertaken of the medical significance of such anti-bacterial agents as phage, sulphidin, streptocide, X-rays and so on.

Science News Letter, November 14, 1942

MEDICINE

New Vaccine in View

Research brings nearer the development of a more powerful anti-typhoid fever vaccine, report of Public Health Research Institute reveals.

► A STEP toward development of a more powerful anti-typhoid fever vaccine has been taken in research by Dr. Jules Freund, New York City Health Department Bureau of Laboratories. Results so far of Dr. Freund's work on both typhoid and diphtheria are announced in the first annual report of the Public Health Research Institute of New York City by Dr. Otto A. Bessey, director of the Institute.

By injecting killed tuberculosis germs and lanolin-like substances into animals, Dr. Freund has discovered, their production of typhoid fever-fighting antibodies is increased in response to invading typhoid germs.

"In a way, this means production of a more potent vaccine against typhoid," Dr. Thomas Rivers, director of the Hospital of the Rockefeller Institute and now Commander in the Medical Reserve Corps, U. S. Navy, as well as chairman of the Institute's scientific council, explains.

"Whether this method actually gives a more potent vaccine for protection of people against typhoid fever, however, cannot be stated until field experiments have been made."

Efforts to increase the potency of diphtheria toxoid by the same methods

are now being made by Dr. Freund.

Nutrition studies are another project of the Institute, which is said to be the only municipal organization of its kind in the world.

Nutritional assays of foods sold in New York City markets will be undertaken in order to find out whether, when the housewife buys foods for their vitamins and minerals, the foods contain the amounts of these essential diet factors she expects them to contain on the basis of food value tables. Meat, vegetables and other foods may vary widely in their vitamin and mineral content according to their region of growth because of the differences in soils in various parts of the country.

Science News Letter, November 14, 1942

Sheep breeders get a higher percentage of *twins* from ewes fattened during the breeding season.

The islands of the *south Pacific* fighting front were once part of a huge mountain chain, now sunk below the sea.

Experiments with various *vitamin* treatments for Wisconsin crops showed no beneficial effects on wheat, barley, clover or alfalfa; some vitamins even causing stunting.



"The Invisible Rainbow that benefits all mankind"

When you look at a rainbow in the sky, you see nature performing a fascinating experiment in optics. Tiny drops of moisture, acting as prisms, have broken the sunlight into its component parts.

The familiar white light we know as sunlight is really a combination of many rainbow bands of color, making up the visible portion of the Photographic Spectrum.

But there's another rainbow in nature . . . an *invisible rainbow* that benefits all mankind.

This is the complete *Electromagnetic Spectrum*, with bands of radiation that stretch out in an infinity of wave lengths on both sides of the Photographic Spectrum.

To the right of the Photographic Spectrum lie the shorter wave lengths of the *Ultraviolet Spectrum*. Here we find the



invisible radiations that make fluorescent tubes glow . . . erythema rays that tan the skin . . . bactericidal rays that kill air-borne bacteria.

Further to the right is the *X-Ray Spectrum* . . . still shorter radiations that science has harnessed to diagnose and heal many human ailments . . . rays that penetrate heavy armor plate.

At the very end of the scale are the *Cosmic Rays* . . . unknown, mysterious cosmic particles that constantly bombard the earth.

To the left of the Photographic Spectrum are the longer wave lengths of the *Infrared Spectrum* . . . invisible radiant heat



waves from the sun that penetrate window glass . . . rays emitted by electric heaters and steam radiators to help warm our homes.

Next, is the *Radio Spectrum* . . . microwaves that guide planes and ships to their destinations . . . longer waves that

bring us radio and television entertainment.

And finally, the longest waves of all, the *Induction-Heating Spectrum* . . . extensively employed by industry in the annealing and heat treatment of metals.

Westinghouse Research Engineers have played a major part in exploring and putting to useful work the myriad radiations in the Electromagnetic Spectrum.

As a result of the "know how" gained through years of experimental work in the Westinghouse Research Laboratories, these scientists have prepared a full-color chart which illustrates and explains every phase of the complete Electromagnetic Spectrum.

How to get this fascinating chart

The Electromagnetic Spectrum Chart, size 30" x 40", lithographed in 8 colors on heavy linen, is now offered to engineers and scientists for only \$2, postage prepaid. Address: Department 6N-17, Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.

Westinghouse

... MAKING ELECTRICITY WORK FOR VICTORY

• New Machines and Gadgets • From Page 311

❁ A ROBOT that distinguishes colors in the same way that the human eye does, has been developed for accurate measurement and matching of colors. Three color filters and three photoelectric cells or electric eyes measure the intensities of the three primary colors in the sample the color of which is being determined. Fading can thus be measured without preserving an unfaded piece of the sample. Whiteness or yellowness of near-white surfaces can also be measured.

Science News Letter, November 14, 1942

❁ HOW TO KEEP your carpet smooth with lamp cords running under it in every direction is shown by a recent patent. The invention is an under-carpet pad with grooves in it running lengthwise and crosswise. The wires are laid in these grooves and are then not only out of sight but cannot even be felt. At intersections of the grooves, curved spaces are provided so that the direction of a wire may be changed without making a sharp bend.

Science News Letter, November 14, 1942

❁ THE CARRYING CASE of a hand movie camera is made to provide support for the camera in an invention recently patented. As the camera is drawn from the case, its lower front edge becomes hinged to the upper front edge of the case. Consequently, when the camera is held at eye level, the back of the case drops down and rests on the chest of the operator. The case thus forms a diagonal brace which supports and steadies the front end of the camera.

Science News Letter, November 14, 1942

❁ A PLASTIC FUSE for a trench mortar shell is what the young lady in the picture is holding. Every such fuse saves a pound of aluminum for our airplanes. Since they are being manufactured in



huge quantities, the saving of aluminum is considerable. The plastic used was specially developed for the purpose. It had to be extra hard, and maintain its dimensions accurately in all weathers.

Science News Letter, November 14, 1942

❁ NEW CHEMICALS stimulate the germination of seeds, induce new root formation of cuttings, improve the general growth, and prevent premature dropping of fruit. They act in the same way that synthetic hormones do, but are safer. The hormones are tricky. A little too much or too long a treatment, and growth is stunted rather than promoted and other damage is done. The chemicals accomplish all that hormones do, the inventor claims, but allow a much wider margin of safety.

Science News Letter, November 14, 1942

If you want more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N St., N. W., Washington, D. C., and ask for Gadget Bulletin 130.

their legs in plaster casts for from 16 to 20 weeks, the men began stepping guardedly about the ward on the second or third day. Every one was able eventually to walk normally and without pain.

Weary of years of limping, a 45-year-old ex-service man came to the Naval hospital for help. His right thigh bone had been broken 17 years before. The injured leg was two and a half inches shorter than the other, and extremely painful to walk on. The bone was cut through obliquely, and a Stader splint applied. By turning the screws a little every few days, the bone and the muscles were gradually and painlessly lengthened. In the first two weeks, the veteran's leg gained one and a quarter inches. Now he can walk in comfort and without the trace of a limp—for the first time in 17 years.

Applying the splint requires anesthesia, but once it is in place only very small dressings are necessary, and sometimes even these are not used after the first 48 hours. The tissue which closes around the pins keeps the holes free of infection. The splint should be applied only by surgeons who have had training in its use.

Few, if any, Stader splints will be available to civilians until after the war, for the entire output of the instrument company now making the splints is being reserved for our service men. But once it is available for civilian use, the splint will be of incalculable benefit to people with broken legs, arms and jaws. It will mean less pain, less expensive nursing and hospital care, less time lost from precious jobs. Hundreds of planes, tanks, and anti-aircraft guns could be

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built in the time lost each year by workers with broken bones.

As the limb fitted with a Stader splint can remain in use, the joints do not stiffen, the muscles do not become weak, and the blood, circulating more freely, can bring a richer supply of repair materials and thus speed up the knitting of the bones. Usually a fracture of the two bones of the lower leg means five or six weeks of traction treatment, with wires and pulleys, and from five to fourteen weeks more in a plaster cast. After that there is generally another two or three months of restricted action, while the weakened, flabby muscles are slowly brought back to normal.

But patients with such fractures seldom have to wear the Stader splint longer than nine weeks. When it is taken off, there is no dreary period of rehabilitation. As the patient has been walking or using his arm most of this time, the muscles are strong and able to carry on as usual.

Often the time wasted by a fracture goes far beyond the period of healing. Doctors have long been troubled by the mental effects of months in a hospital bed. Gradually a man with a slow-healing leg fracture loses his interest in the outside world, and takes on the resigned attitude of a permanent invalid. Sometimes it is a full year after leaving the hospital before he arouses himself enough to get another job. A patient able to leave his bed within a few days escapes this mental hazard.

This new method may be of immense benefit in a battle or a blitz. Patients with legs slung from wires or encumbered by plaster casts cannot quickly be moved to safety. From Bataan comes a story of Medical Corps men cutting traction wires and ordering soldiers with broken legs to get under the beds when Jap fliers bombed the hospital. But patients wearing the Stader splint can easily get away, in many cases under their own power.

According to a report by the Surgeon-General, in the last war, nearly one-third of all days lost from disability involved fractures. Over 46 per cent of discharges due to disability were the result of broken bones; the days lost for which fractures were responsible reached the staggering total of 5,125,220!

Because a veterinarian wanted, years ago, to make pet dogs more comfortable than was possible with the usual casts and splints, we now have a new weapon against suffering in peace and loss of time and men in war.

Science News Letter, November 14, 1942



Not Always Latex

➤ "LATEX" and "rubber" have come to be practically synonymous in the minds of many persons. Any plant with milky juice is apt to be regarded as the grand solution to all our rubber problems. Contrariwise, any plant that doesn't "bleed white" when you cut it is dismissed as hopeless so far as rubber is concerned.

Nothing could be farther from truth. Some plants with milky sap, like dandelion and poppy, contain no rubber at all, or so little as not to count. Milkiness is not necessarily an indicator for rubber, but merely the mark of an emulsion, that is, of a liquid with millions of minute droplets of some other substance, like an oil or a resin, suspended in it. Common cow's milk is an emulsion: globules of butterfat and other substances suspended in watery whey. Non-rubbery plant latexes usually are emulsions of resins, which are exactly what a tire-maker doesn't want.

Wholly without latex are several of the plants now regarded as most promising alternative sources of natural rubber, notably guayule, kok-sagyz, rabbit-brush and goldenrod. Instead of being emulsified as minute droplets in a watery medium to form a latex, the rubber in these plants is embedded as small solid particles or shreds in the living tissues themselves.

Extracting rubber that occurs in this form is quite a different problem from that presented by the latex-producing group of rubber plants. Guayule and kok-sagyz (the only ones at present used on a practical scale) are harvested as whole plants, which are dried and then ground down to an impalpably fine pulp in pebble mills. The rubber particles are then separated out of this

● RADIO

Saturday, November 21, 1:30 p.m., EWT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Charles R. Reed, senior meteorologist in charge of Des Moines Weather Observatory, will discuss "Bumper Crop Weather."

Tuesday, November 17, 7:30 p.m., EWT

Science Clubs of America programs over WRUL, Boston, on 6.04, 9.70 and 11.73 megacycles.

One in a series of regular periods, over this short wave station to serve science clubs, particularly in the high schools, throughout the Americas. Have your science group listen in at this time.

Monday, November 16, 9:15 a.m., EWT; 2:30 p.m., CWT; 9:30 a.m., MWT; and 1:30 p.m., PWT

Science at Work, School of the Air of the Americas over the Columbia Broadcasting System, presented in cooperation with the National Education Association, Science Service and Science Clubs of America.

"Explosives at Work" will be the subject of the program.

"soup" by suitable chemico-physical means. The whole process is tedious, and costlier than rubber manufacturers would like to have it. Department of Agriculture technologists are now hard at work, in efforts to simplify it and make it cheaper.

One curious thing about these plants that produce their rubber solid is that they belong to the same botanical family, the composites. This is the very large, evolutionally highly successful group that contains sunflowers, dandelions, wild asters, daisies, lettuce, thistles, artichokes and ragweeds.

By no means all composites contain rubber; only a few do. But all rubber-producing composites worth bothering with have it embedded as solid particles, not as latex. What this may signify nobody knows as yet; it just stands as a curious botanical coincidence.

Science News Letter, November 14, 1942

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First Glances at New Books

► AS KNOWLEDGE is advanced concerning mental illnesses and those who suffer from them, more accurate diagnoses and a better identification of mental diseases becomes possible. In *PERSONALITY AND MENTAL ILLNESS*, (*Emerson Books*, \$2.75), Dr. John Bowlby, British psychiatrist, gives the basis for a clearer understanding of this problem, built from observation of the lives and personalities of patients before as well as after their illnesses developed. He lists traits of personality which seem to mark the boy or girl who will later become mentally ill.

Science News Letter, November 14, 1942

► STRANGELY, the myth of a "superior" race is traced in *MAN'S MOST DANGEROUS MYTH*, by M. F. Ashley-Montagu (*Columbia University Press*, \$2.25), to the champions of slavery in England and later in America, France and Holland. At that time in Germany, the dangers of such loose and prejudiced utterances were vigorously denounced by such thinkers as Kant, Hardenberg, Herder, Goethe and Novalis. If you are interested in exploring the background

that made the Germans fall for the myth as others were recovering from such unscientific thinking, you will want to read this clear review of the history of the race pseudoscience.

Science News Letter, November 14, 1942

► ARE YOU SCARED? Of course you are. In these days fear is a constant companion with which we might as well get acquainted. In *VICTORY OVER FEAR*, (*Reynal & Hitchcock*, \$2), John Dollard, Yale psychologist, tells you of practical things to do about your own fears—how you can actually get them to work for you as a result of self-study.

Science News Letter, November 14, 1942

► PRACTICAL ADVICE for women on war-time dressing is found in *How to DRESS in WARTIME*, by Winifred Raushenbush (*Coward McCann*, \$2). A useful part of the book is the appendix, which includes War Production Board tables and data on the conservation of clothes. Four government agencies have checked on the author's conclusions on the clothing problem.

Science News Letter, November 14, 1942

Just Off the Press

AERIAL PHOTOGRAPHS, THEIR USE AND INTERPRETATION—A. J. Eardley—*Harper*, 203 p., illus., \$2.75. Beautifully illustrated book on a war-important subject intended particularly for those who have some knowledge of geology.

AMERICA AT WAR—Samuel Van Valkenburg—*Prentice-Hall*, 296 p., illus., \$2.50.

AMERICAN GEOPHYSICAL UNION TRANSACTIONS OF 1942: Part I—REPORTS AND PAPERS, JOINT REGIONAL MEETINGS, SECTION OF HYDROLOGY—*National Research Council, National Academy of Sciences*, 171 p., illus., \$1.25.

AMERICANS VS. GERMANS: THE FIRST AEF IN ACTION—Edward S. Johnston and others—*Penguin Books and Infantry Journal*, 189 p., 25c.

A.S.T.M. STANDARDS ON COAL AND COKE—Committee D-5—*American Society For Testing Materials*, 122 p., \$1.35.

AND KEEP YOUR POWDER DRY: AN ANTHROPOLOGIST LOOKS AT AMERICA—Margaret Mead—*Morrow*, 274 p., \$2.50.

BETTER RURAL CAREERS (National ed.)—Paul W. Chapman—*Science Research Associates*, 264 p., illus., 96c. For young people from grade 6 and up.

BOOK OF MODERN WARPLANES—Harold H. Booth—*Garden City*, 25 p., illus., \$1. Realistic colored plates and brief descriptions which should aid in identification.

A CAREER IN ENGINEERING—Lowell O. Stewart—*Science Research Associates*, 48

p., illus., 1-3 copies, 60c each, 4-9, 55c; 10-24, 45c; 25 or more, 40c each. Occupational monograph no. 30 of the American Job Series for young people who intend to follow a technical career.

CLIMATOLOGY—Thomas A. Blair—*Prentice-Hall*, 484 p., \$5.00.

CONTRACEPTION AND FERTILITY IN THE SOUTHERN APPALACHIANS—Gilbert Wheeler Beebe—*Williams & Wilkins*, 274 p., \$2.50.

CONTROLLED ATMOSPHERES—*American Society for Metals*, 232 p., illus., \$4. Contains the papers and discussions constituting the symposium on controlled atmospheres presented before the 23rd annual convention of the American Society for Metals held in Philadelphia in 1941.

ELECTRICAL COUNTING, WITH SPECIAL REFERENCE TO COUNTING ALPHA AND BETA PARTICLES—W. B. Lewis—*Cambridge Univ. Press*, 144 p., \$2.50.

ENGLISH LANGUAGE AND LITERATURE: AUDIO-VISUAL AND TEACHING AIDS—compiled by L. Patricia Brach and others—*New Jersey State Teachers College*, 34 p., 50c. Mimeographed.

FOOD PROCESSING—A. O. Duncan—*Turner E. Smith*, 544 p., illus., \$3.00. A guide to selecting, producing, preserving and storing the family food supply. Text book.

GERMAN PSYCHOLOGICAL WARFARE—Ladislav Farago and others—*Putnam's*, 302 p., \$3. Prepared by the Committee on National Morale.

GOALS FOR AMERICA—Stuart Chase—*Twentieth Century Fund*—134 p., \$1.

GOOD NUTRITION FOR EVERYBODY—L. Jean Bogert—*Univ. Chicago Press*, 165 p., \$1.50. "A working knowledge of nutrition for every woman." Includes recipes.

THE HORMONES IN HUMAN REPRODUCTION—George W. Corner—*Princeton Univ. Press*, 265 p., illus., \$2.75.

HOW EVERY BOY CAN PREPARE FOR AVIATION SERVICE—Keith Ayling—*Garden City*, 125 p., illus., 50c. High school students and younger boys.

HOW TO BE FIT—Robert Kiphuth—*Yale Univ. Press*, 131 p., illus., \$2. Exercises for boys and men.

HOW TO TEACH NUTRITION TO CHILDREN—Mary Pfaffmann and Frances Stern—*M. Barrows & Co.*, 224 p., \$2.

JEWELRY, GEM CUTTING AND METALCRAFT—William T. Baxter—*Whittlesey*, 287 p., illus., \$2.75. New revised edition.

MANUAL OF WAR-TIME HYGIENE—Dean Franklin Smiley and Adrian Gordon Gould—*Macmillan*, 86 p., \$1. Supplement to "A College Textbook of Hygiene." This pamphlet provides a "brief summary and bibliography of those materials which a college student should add to his regular college hygiene course in order that he may be equipped to meet his health responsibilities as an officer in the Armed Forces or in Civilian Defense work in the years immediately following his graduation."

MATHEMATICS: VISUAL AND TEACHING AIDS—compiled by E. H. C. Hildebrand—*New Jersey State Teachers College*, 15 p., 25c. Mimeographed.

MEMOIRS OF A GUINEA PIG: EIGHT YEARS IN A DOCTOR'S WAITING ROOM—Howard Vincent O'Brien—*Putnam's*, 238 p., \$2.

RAPID REVIEW OF ELEMENTARY ALGEBRA—Jonas T. May—*The Penny Press*, 31 p., 12c.

SAFE DELIVERANCE—Frederick C. Irving—*Houghton Mifflin*, 308 p., \$3.

6 MINUTES TO FITNESS—Lilyan Malmstead—*M. Barrows & Co.*, 96 p., illus., \$1.50.

STRUCTURAL GEOLOGY—Marland P. Billings—*Prentice-Hall*, 473 p., illus., \$4.50.

SUBNORMAL ADOLESCENT GIRL—Theodora M. Abel and Elaine F. Kinder—*Columbia Univ. Press*, 215 p., \$2.50.

TECHNICAL HANDBOOK FOR SOLVING PROBLEMS IN SHOP OR FACTORY—Edward H. Lang—*Prentice-Hall*, 100 p., \$1., colleges, 80c. "The application of mathematics and science to the industrial job."

THIS IS OUR WAR—Fern Long—*American Library Assn.*, 14 p., 25c. Reprint of Vol. 36, No. 11 of *ALA Bulletin*. Excellent bibliography on war books, compiled by the adult education field worker of the Cleveland Public Library.

THOUGHTS OF A PSYCHIATRIST ON THE WAR AND AFTER—William A. White—*Hoebner*, 28 p., \$1.50. Because of the value and timeliness of this book, despite the fact that it was first brought out in 1919, this reprint has been published.

YOU MUST RELAX—Edmund Jacobsen—*Whittlesey*, 261 p., \$1.75. New revised edition.

WHEN DOCTORS ARE RATIONED—Dwight Anderson and Margaret Baylous—*Coward-McCann*, 255 p., \$2.

WILD VIOLETS OF NORTH AMERICA—Viola Brainerd Baird—*Univ. of Calif. Press*, 225 p., illus., \$10. Beautiful colored plates.